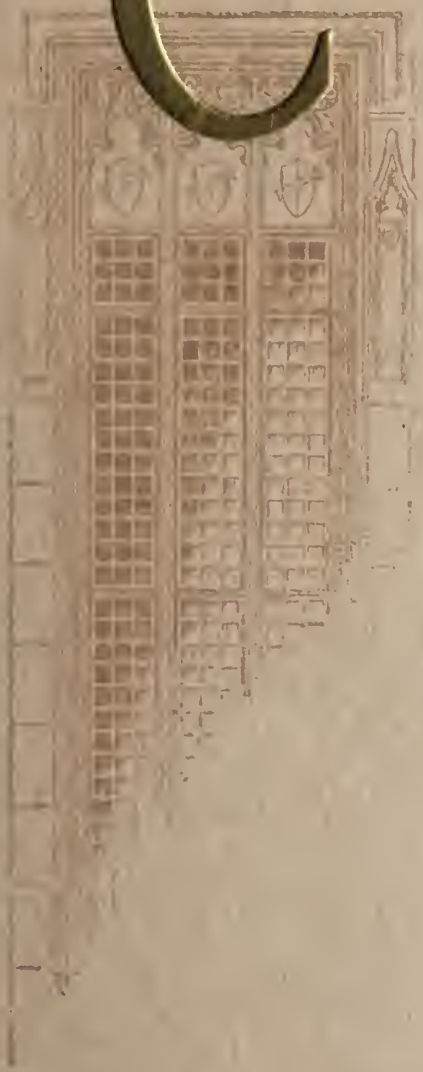
CAST STONE



The More You Mention
THE ARCHITECTS SAMPLES CORPORATION
The More Manufacturers File Samples, and
The More Complete Our Service to You

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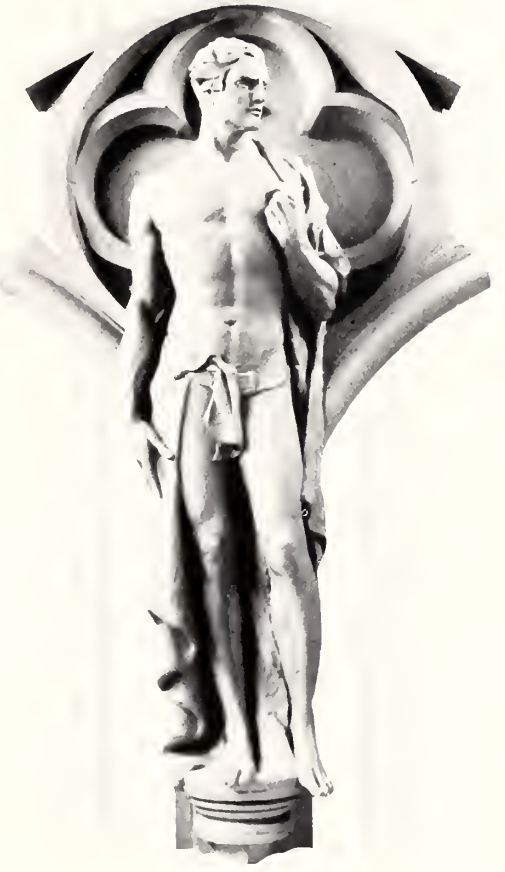
CAST STONE



Published by

THE CAST STONE INSTITUTE

FOREWORD

CAST STONE is a building stone molded from especially prepared concrete in which the aggregate is selected for durability and appearance.

It is now generally recognized that concrete is indispensable in modern engineering and architectural developments. Its structural advantages, durability, fireproofness and general adaptability have long been known. Besides these properties it possesses decorative and esthetic possibilities which are still further widening the field of its usefulness.

Cast stone exemplifies the use of concrete as architectural finish or decoration. Definite and reliable information on this material is presented herein. It is hoped that this publication may be helpful in giving the reader a clear understanding of the inherent qualities of cast stone and especially give him a true appreciation of its possibilities.

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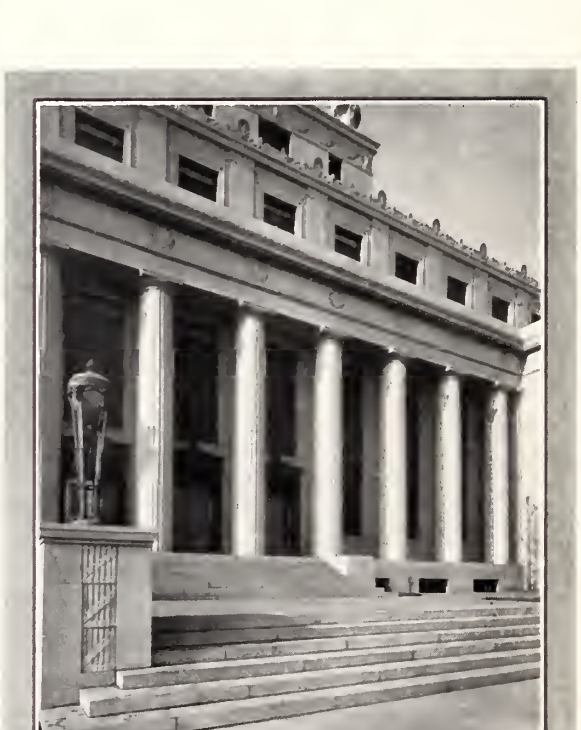


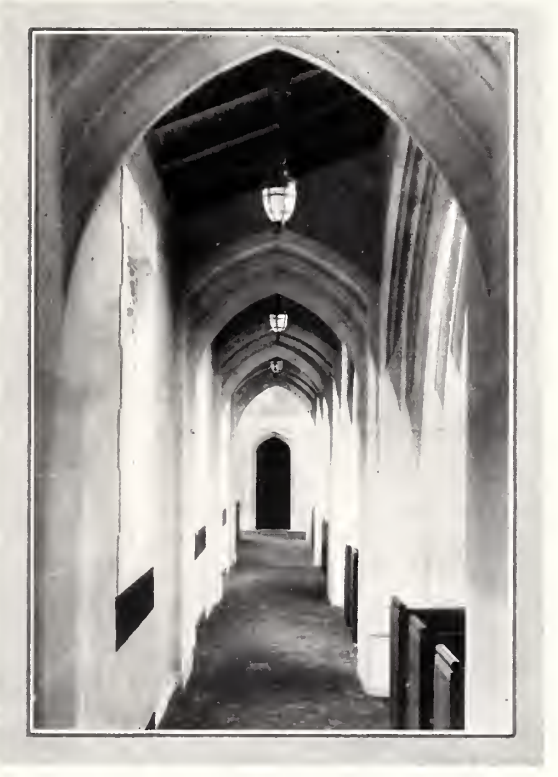
CITY HALL, GARY, IND.
PHILIP B. MAHER, *Architect*
A view of the entire building is shown on page 6

Classic
AT
1250
C27
1930

Characteristics of Cast Stone

THIS is an age of scientific research and discovery. Untiring efforts are being expended to develop the new and to improve the old. Material substances are constantly being analyzed, separated into their component elements and the original substances reproduced by a process of gathering together and combining similar elements. In this process, by changing the original proportions or by adding new elements, it is possible to impart new qualities to the product or to improve existing qualities.

The production of cast stone is an interesting application of the process described above. Carefully selected stone is pulverized and treated to produce portland cement. This cement is mixed with especially prepared aggregate and water and placed in molds. Color may be added through the medium of special aggregates or mineral pigments. Upon hardening the mixture becomes cast stone, the color and form of which might have been varied at will. It may be much harder and denser than quarried stone. Its surface may be given any of the various finishes that have been used in the past on quarried stone as well as many others which are obtained only in cast stone.



CHURCH OF THE GOOD SHEPHERD, JACKSONVILLE, FLA.
CORBUSIER, LANSKI & FOSTER, *Architects*
MELLEN GREELEY, *Associate Architect*

The ability to be fashioned easily and accurately is a property especially valuable in a building material. Cast stone possesses this property by virtue of its process of manufacture wherein natural stone is broken down, given the quality of temporary plasticity and molded into any desired shape and size. However, cast stone of today is considerably more than molded or precast concrete. It must possess not only utility and the strength and durability of good concrete, but beauty in color, design and execution as well. Cast stone is a highly refined form of concrete. Its claim to recognition and usefulness is based on its own merits —its architectural adaptability, decorative possibilities and durability.

With this conception of cast stone it is well to bear in mind that it is a product which is of necessity a reflection of the ability of its manufacturer. The manufacturing of cast stone requires capital, adequate plant facilities, an efficient organization and a knowledge of concrete technique and architectural style. The brief discussion of the considerations involved in the production and use of cast stone given in this booklet will aid in the proper appreciation of the material and its application to architecture.

CHIMES BUILDING, SYRACUSE, N. Y.
SHREVE & LAMB, *Architects*
Cast stone has been used from grade to skyline

LEVY BROTHERS BUILDING, HOUSTON, TEX.
JOSEPH FINGER, *Architect*
The lower stories, spandrels and all ornamentation are cast stone

LITTLE BUILDING, BOSTON, MASS.
BLACKALL, CLAPP & WHITTEMORE
Architects

MONTGOMERY BUILDING, SPARTANBURG, S. C.
LOCKWOOD GREENE ENGINEERS, INC., *Designers*

MEDICAL ARTS BUILDING, HOUSTON, TEX.
SANGUINET, STAATS, HEDRICK & GOTTLIEB, *Architects*

Advantages of Cast Stone

Mass, accentuated by simplicity of line, is coming to be recognized as the distinguishing characteristic of modern American architecture. Although the passing of elaborate decorations and treatments is to be observed in more recent designs, it is unlikely that the architectural trend will swing to the other extreme of severe plainness.

Considerations of economy have played a large part in the development of present day styles of architecture and have imposed limitations upon the use of ornamentation. Modernistic design is based on simplicity, which in turn is based on economy. There still exists, however, a natural desire to employ adequate and suitable embellishments on buildings. For the sake of beauty in architecture it therefore becomes increasingly necessary that building materials should in themselves contribute beauty without undue cost.

TELEPHONE BUILDING, SYRACUSE, N. Y.
VOORHEES, GMELIN & WALKER, *Architects*

The accompanying illustrations show some examples of cast stone ornamentation. All the decorative details are molded and in most cases tooled to secure added sharpness of line. The cost of such surface enrichments might be prohibitive if the entire ornament had to be carved.

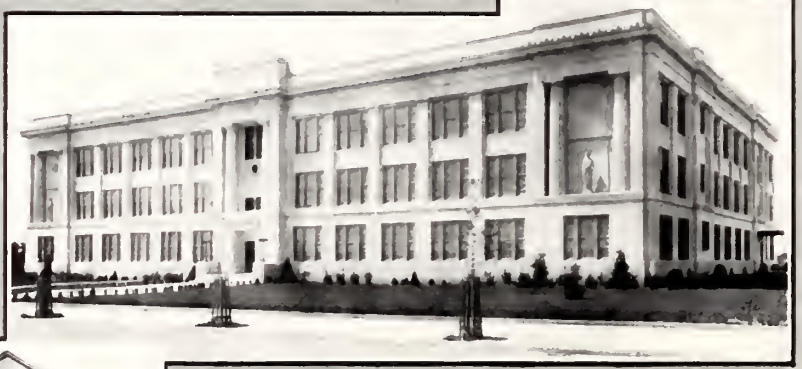
It is the property of being temporarily plastic which gives cast stone the advantage of unlimited decorative possibilities. This same property makes possible shaping of pieces to meet definite architectural and structural requirements.

The wealth of detail in the cast stone panels above the windows and doorway of this store front is a striking example of the adaptability of the material to intricate ornamentation

A perforated cast stone altar rail in the Church of the Most Precious Blood, Philadelphia, Pennsylvania. The possibilities of molding delicate designs in cast stone are almost unlimited

MOOSE TEMPLE, HARRISBURG, PA.
CLAYTON J. LAPPLEY, *Architect*

Below:
TEMPLE OF SCOTTISH RITE MASONRY, OAKLAND, CALIF.
CARL WERNER, *Architect*



EAST END JUNIOR HIGH SCHOOL, RICHMOND, VA.
CHARLES M. ROBINSON, *Architect*

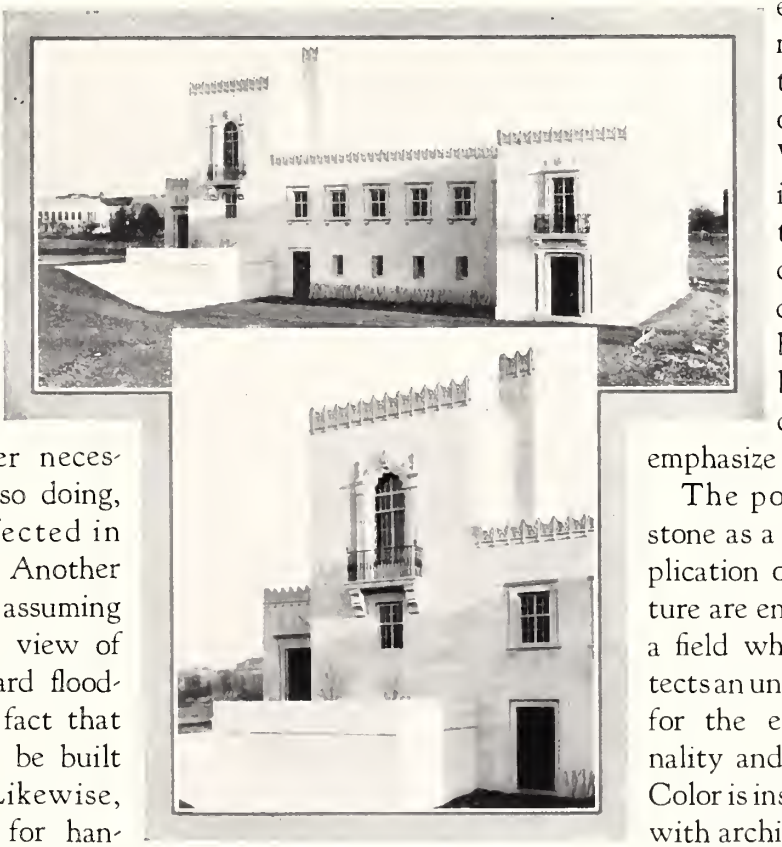
YORK RITE TEMPLE, WICHITA, KAN.
EBERSON & WEAVER, *Architects*

Right:
CITY HALL, GARY, IND.
PHILIP B. MAHER, *Architect*

Left
ELKS CLUB HOUSE,
JACKSONVILLE, FLA.
R. A BENJAMIN,
Architect

Right:
KNIGHTS OF COLUMBUS
BUILDING, ATLANTIC
CITY, N. J.
FRANK BERRY, *Architect*

Many building materials are characterized by a technique of use which has developed either from structural limitations of the material or from economical manufacturing processes. Cast stone is not restricted by any such limitations. It can be manufactured in any desired shape or size, depending upon what size of unit best fits in with the design. Large pieces can be reinforced whenever necessary, or where, by so doing, savings can be effected in structural members. Another advantage which is assuming more importance in view of modern trends toward flood-lighting lies in the fact that conduits may easily be built into cast stone. Likewise, hooks and hangers for handling and setting can be embedded in the cast stone units as they are molded.



FIELD HOUSE, FENWAY PARK, BOSTON, MASS.
WILLIAM D. AUSTIN, *Architect*
The plainness of the cast stone walls, emphasizing the simplicity in the design, is effectively relieved by the decorative parapet, window and door molds

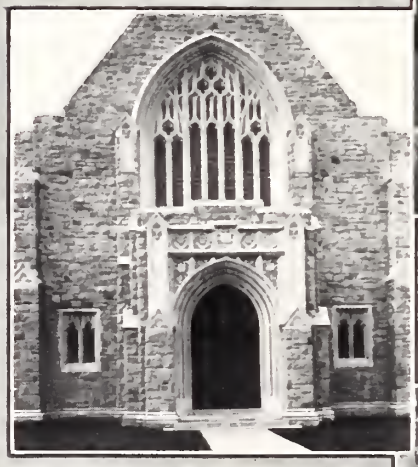
One of the principal advantages of cast stone is the wide range of color permitted by its use. Different colored aggregates combined with mineral coloring pigments make possible this broad latitude of color treatments. Walls may be done in one color while the ornament—columns, belt courses, spandrels, bandings—may be done in another color as required to emphasize the design.

The possibilities of cast stone as a medium for the application of color to architecture are endless. Therein lies a field which offers to architects an unlimited opportunity for the expression of originality and decorative genius. Color is inseparably connected with architectural design. As an artist visions a painting and finds at hand the materials with which he can ex-

GRACE LUTHERAN CHURCH,
WADSWORTH, OHIO
REYNOLD H. HINSDALE, *Architect*

P. E. DIVINITY SCHOOL
PHILADELPHIA, PA.
ZANTZIGER, BORIE & MEDARY,
Architects

Below:
HARTFORD SEMINARY
FOUNDATION, HARTFORD,
CONN.
ALLEN & COLLENS,
Architects



ST. BARTHOLOMEW'S CHURCH,
WHITE PLAINS, N. Y.
CHERRY & MATZ, *Architects*

ST. PAUL'S CHURCH, YONKERS, N. Y.
CRAM & FERGUSON, *Architects*

ST. LUKE'S CATHEDRAL, ORLANDO, FLA.
FROHMAN, ROBB & LITTLE, *Architects*

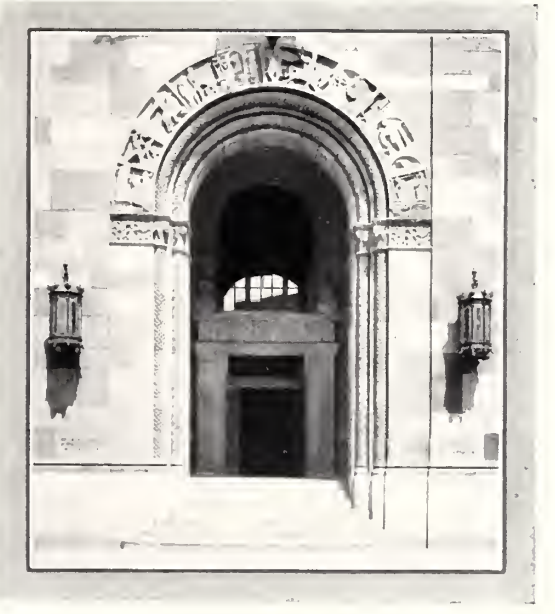
WILLIAM S. HACKETT JUNIOR HIGH SCHOOL, ALBANY, N. Y.
MARCUS T. REYNOLDS, *Architect*

press his ideas on canvas so may an architect vision an edifice and in cast stone find a material with which he can produce the effects that he desires. Through its use he may make sure that the beauty of his creations will not be sacrificed to the limitations of other available building materials.

Many of the world's most beautiful stones are not practical for building because of their scarcity or extremely high cost. Their beauty and individuality can be utilized for architectural decoration, however, through the medium of cast stone in which they can be incorporated as aggregate. Similarly, many stones, unique and interesting for their color and structure, occur in irregular or broken veins from which they cannot be quarried in pieces large enough for building purposes. They are entirely suitable for use as aggregate in cast stone, which makes them available to architecture in a convenient and adaptable form.

Cast stone lends itself readily to the molding of complicated shapes and highly ornamental details without the necessity of sacrificing quality of the concrete for intricacy of design. It may thus be expected to preserve indefinitely the beauty of its color and surface treatment and the grace of the architectural motifs expressed in it. Strength and density are generally accepted as reliable indications of the quality of concrete in its various forms. In order to insure durability of cast stone in both its plain and ornamental forms, the American Concrete Institute through its tentative standard specification requires that cast stone have a minimum compressive strength of 5,000 pounds per square inch and an absorption of not more than 7 per cent. While these are rigid requirements, they are readily met with the degree of care that is necessarily a part of the manufacture of high grade cast stone.

The ability of cast stone to remain clean and free from discoloration is another of its advantages. Disfigurement caused by dirt, soot and gases taken from the atmosphere by highly absorptive materials fre-



ENTRANCE, LAWYERS TITLE & GUARANTY CO., WHITE PLAINS, N. Y.
ANDREW J. THOMAS, *Architect*
Close control of color is an advantage of cast stone which makes it a sensitive medium for the execution of color effects

RICHMOND GARAGE, RICHMOND, VA.
LEE, SMITH & VAN DERVOORT, *Architects*
Facing, ornaments and colored bandings are cast stone

Detail of an ornamental cast stone entrance to an industrial building
CLARENCE B. MCKAY, *Architect*

quently obscures the beauty of buildings so far as architectural lines and decorative details are concerned. Proper design and careful setting will help to overcome this difficulty but the density and non-staining properties of the material are factors of utmost importance.

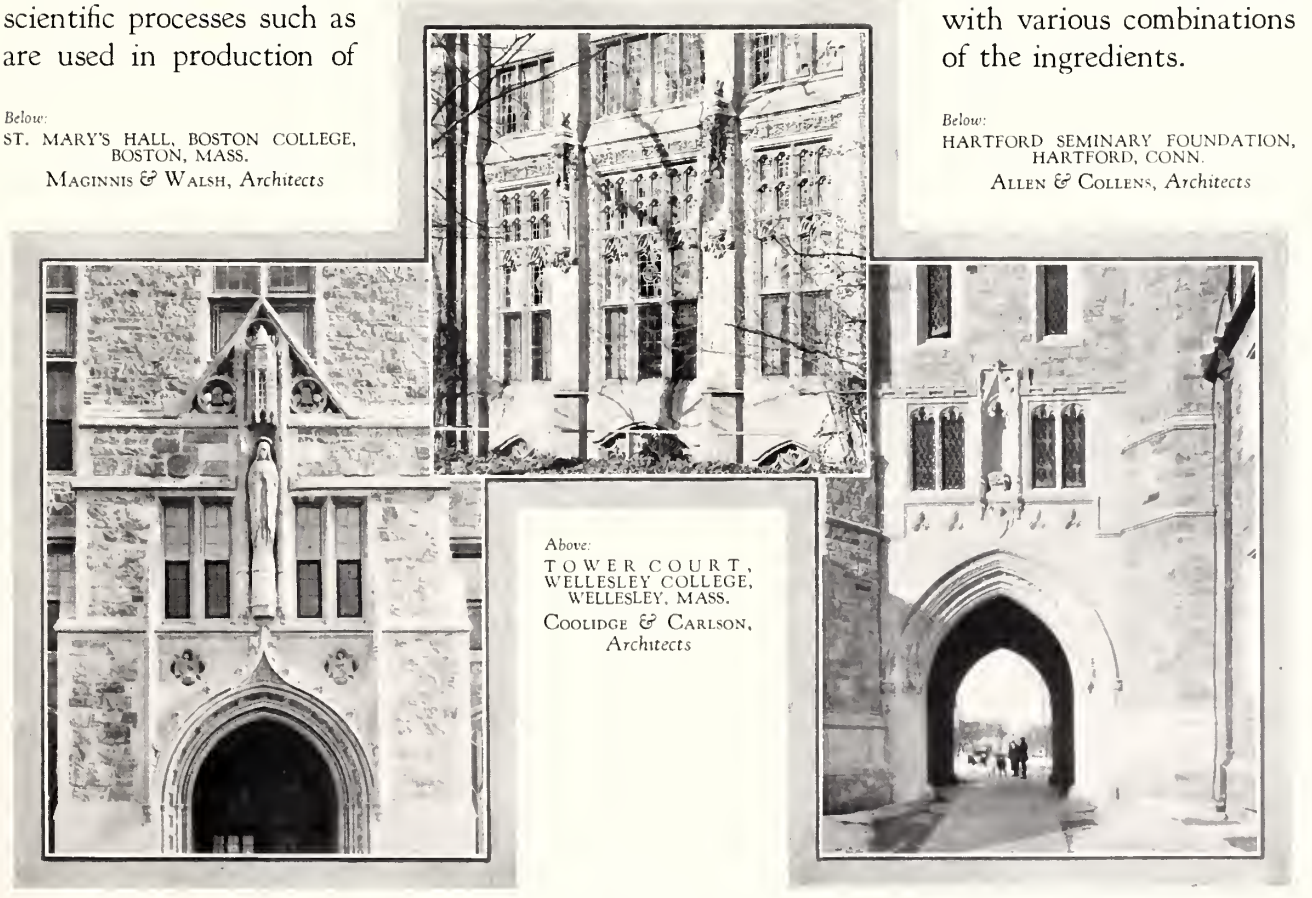
In this respect cast stone is unexcelled. Buildings faced with it, because of their freedom from discoloration, usually stand out in striking contrast to adjacent structures which are faced with other materials.

The uniformity of quality which is characteristic of cast stone gives it unusual dependability. Such dependability is an inherent advantage of scientific processes such as are used in production of cast stone, wherein all ingredients are carefully selected and graded, accurately proportioned and thoroughly mixed. It should not be considered as any reflection upon Nature, however, that science can improve her product.

In repairing or extending old buildings every architect has at times faced the difficulty of matching stonework. It is a comparatively easy matter to duplicate cast stone in after years because each job is made according to a definite formula of which a permanent record is kept by the manufacturer. Even without formulas, experienced manufacturers can generally duplicate cast stone or match natural stone by experimenting with various combinations of the ingredients.

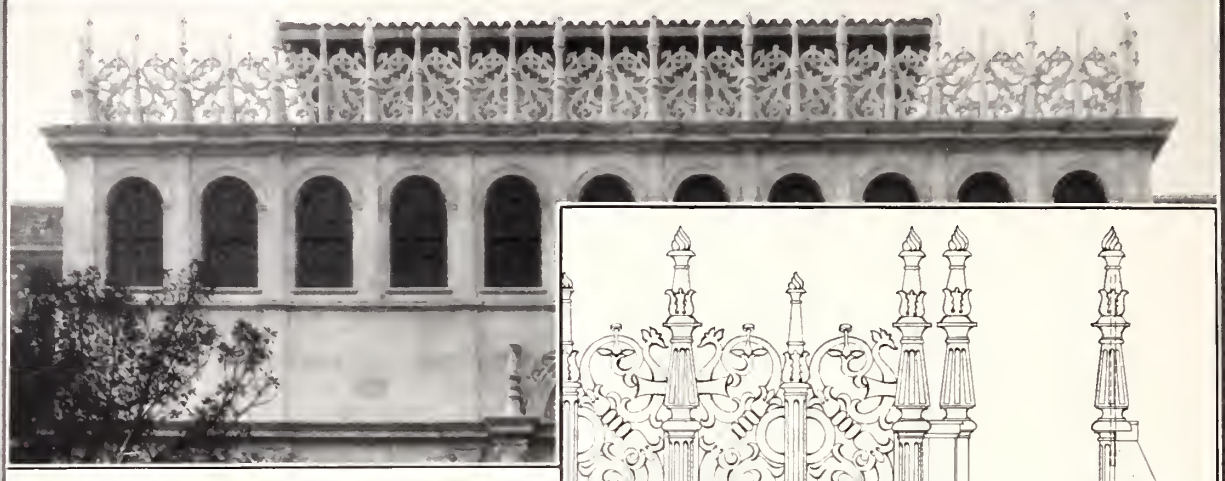
TOWER, PLAZA THEATRE & SHOP BUILDING, KANSAS CITY, MO.
EDWARD W. TANNER, *Architect*. BOLLER BROS., *Associate Architects*

Below:
ST. MARY'S HALL, BOSTON COLLEGE, BOSTON, MASS.
MAGINNIS & WALSH, *Architects*

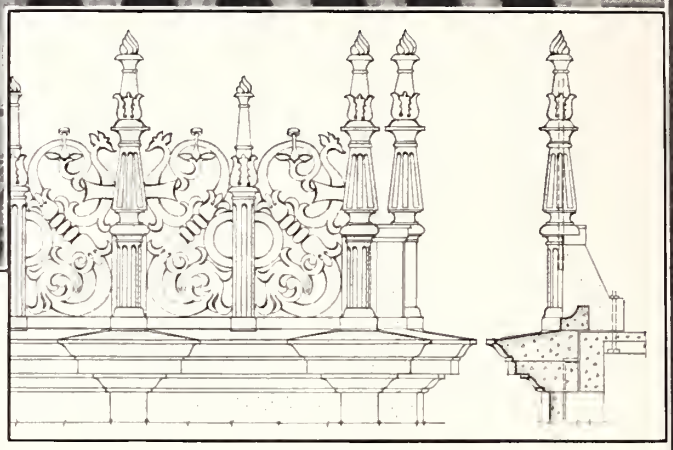


Above:
TOWER COURT, WELLESLEY COLLEGE, WELLESLEY, MASS.
COOLIDGE & CARLSON, *Architects*

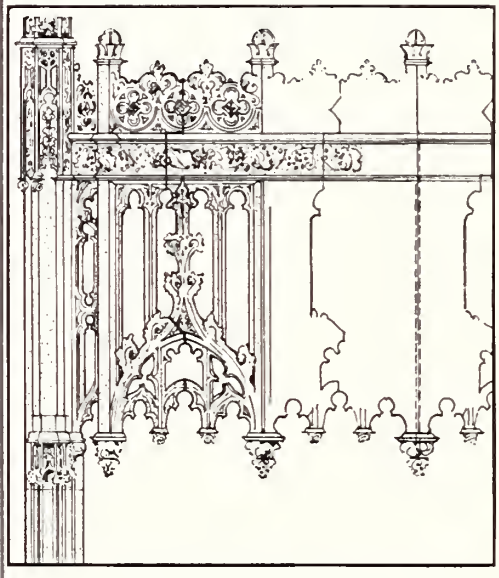
Below:
HARTFORD SEMINARY FOUNDATION, HARTFORD, CONN.
ALLEN & COLLENS, *Architects*



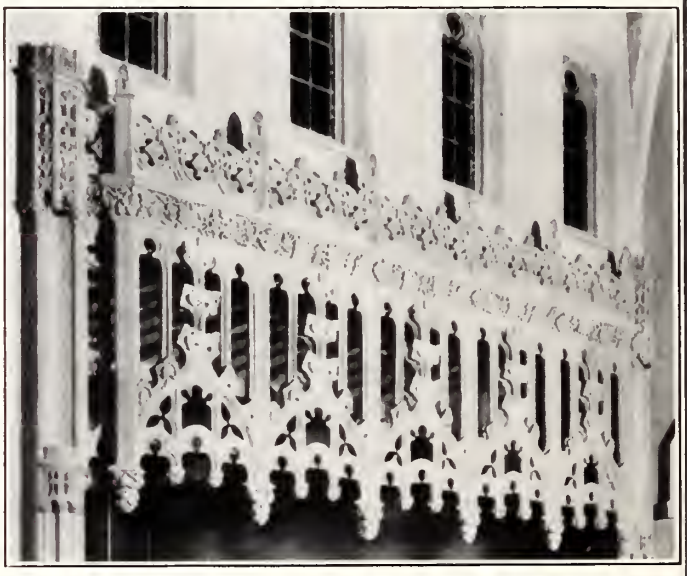
Detail of openwork parapet
LIBRARY BUILDING, HOUSTON, TEX.
GLOVER & SONS, *Architects*



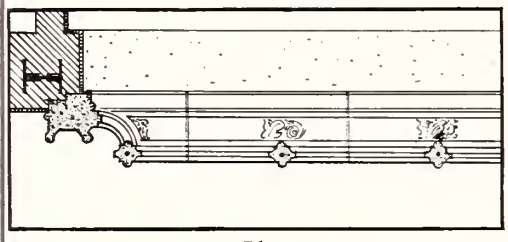
Part elevation



Elevation reading room side

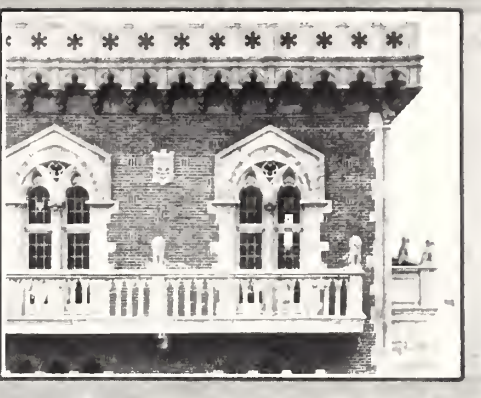


Ornamental cast stone screen
READING ROOM, LIBRARY, HAMILTON COLLEGE
CLINTON, N. Y.
COOLIDGE & CARLSON, *Architects*



Plan

ALDEN PARK MANOR APARTMENTS,
GERMANTOWN, PA.
K. M. DeVos, *Architect*



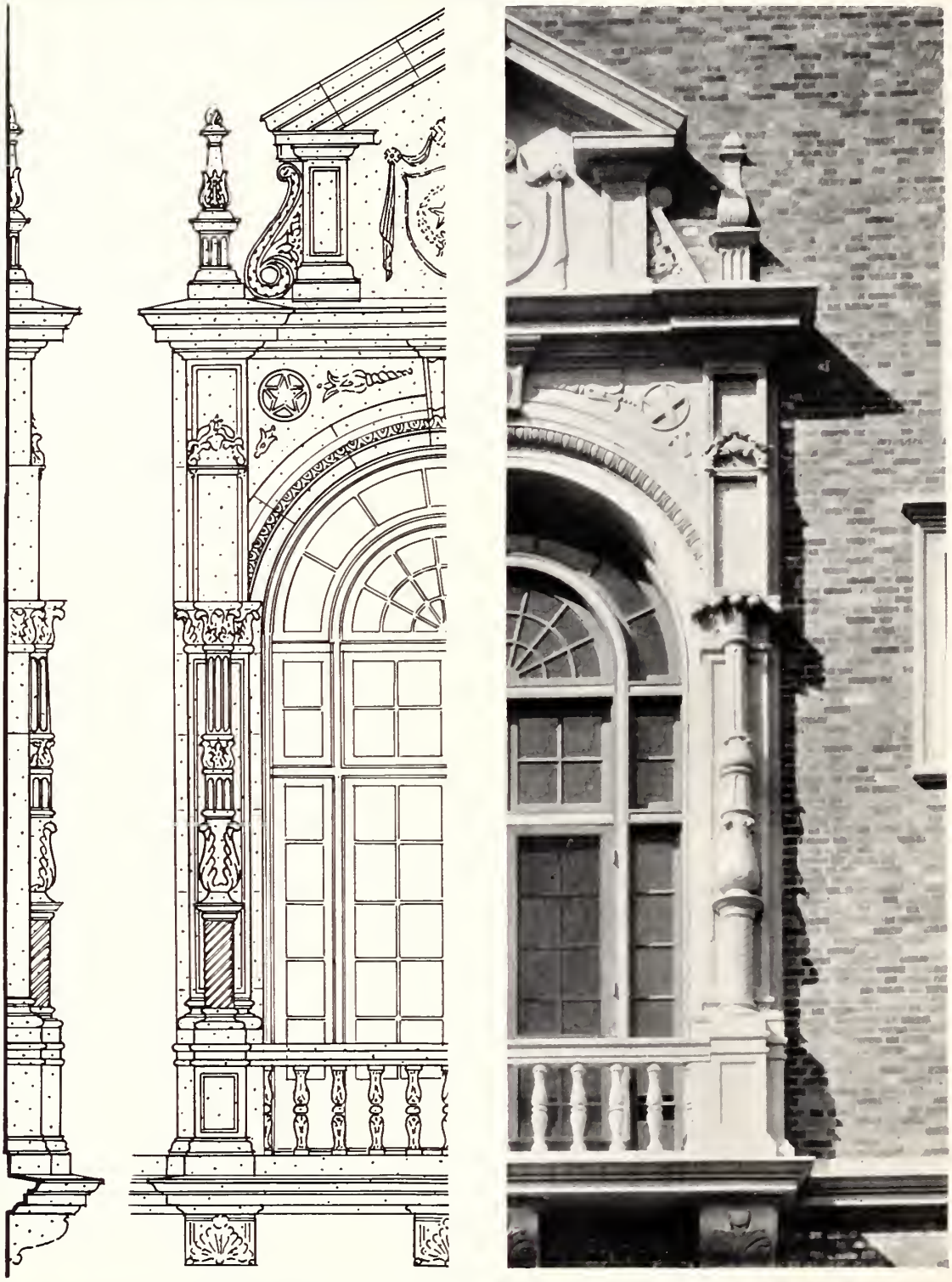
DETAIL, CITY CLUB BUILDING,
ST. LOUIS, MO.
T. P. Barnett Company, Inc.,
Architects

SLATTERY BUILDING, SHREVEPORT, LA.
Mann & Stern, *Architects*

The wide range of colors in which cast stone is available makes it unusually effective as trim on buildings faced with other materials.

MASONIC TEMPLE, ROCHESTER, N. Y.
Osgood & Osgood, *Architects*

ENTRANCE, ILLINOIS BELL TELEPHONE CO., CHICAGO, ILL.
Warner M. Pearson, *Architect*



Detail of balcony window, Library Building, Houston, Texas

GLOVER & SONS, *Architects*

Cast stone fountain, patio, City Hall, Pasadena, Calif.
BAKEWELL & BROWN, *Architects*

An interesting study in cast stone

Cast stone balustrade in the Noyes Buick Company showroom, Boston, Mass.
ARTHUR H. BOWDITCH, *Architect*

Cast stone entrance gate, estate of Mrs. Charles Ringling, Sarasota, Fla. Designed by JOSEPH LANGE

Entrance, urns and flagstones are cast stone

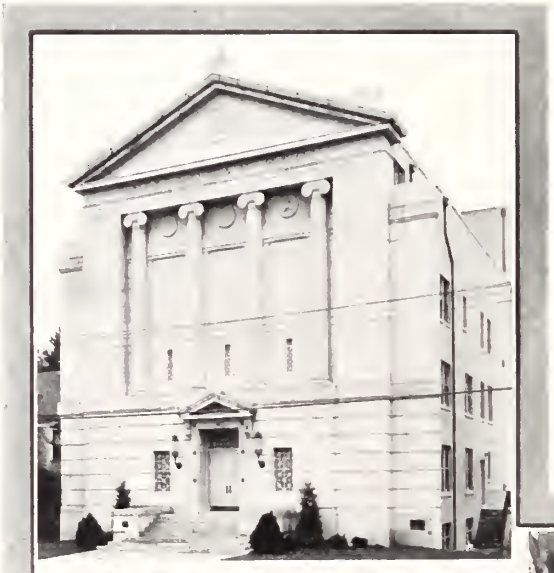
MEMORIAL ARCH, PLUSH MILL BRIDGE,
NEAR PHILADELPHIA, PA.

GARDEN, RINGLING MUSEUM OF ART, SARASOTA, FLA.
The rare collection of statuary is set off by cast stone in walls and balustrades

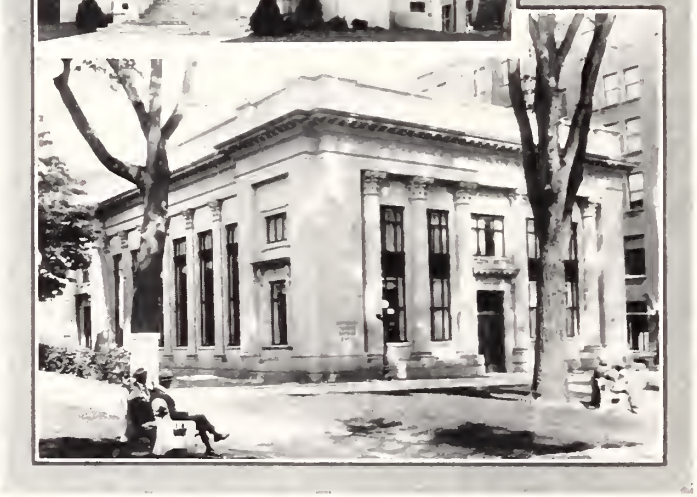
FOX THEATRE, SAN FRANCISCO, CALIF.
THOMAS W. LAMB, *Architect*, H. A. MINTON, *Asso.*

HAMDEN BANK AND TRUST COMPANY, NEW HAVEN, CONN.
NORTON & TOWNSEND, *Architects*

MASONIC TEMPLE, BINGHAMTON, N. Y.
WALTER H. WHITLOCK & CHARLES CONRAD, *Architects*



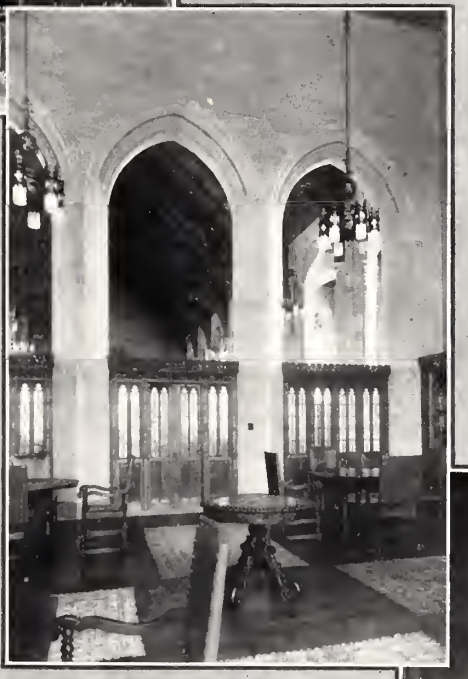
MASONIC TEMPLE,
GREENSBORO, N. C.
JOHN B. CRAWFORD,
Architect



JEFFERSON COUNTY SAVINGS BANK, WATERTOWN, N. Y.
LANSING & GREENE, *Architects*

BASKIN STORE, CHICAGO, ILL.
HOLABIRD & ROOT, *Architects*

FIRST NATIONAL BANK, SAN ANTONIO, TEX.
SANGUINET & STAATS, *Architects*
Walls and columns of this banking room are cast stone



LIBRARY, BOSTON COLLEGE, BOSTON, MASS.
MAGINNIS & WALSH, *Architects*
Above, reading room. Right, conference room

Below:
CHAPEL ADDITION, FIFTH AVENUE PRESBYTERIAN CHURCH, NEW YORK, N. Y.
JAMES GAMBLE ROGERS, *Architect*

Below:
CHAPEL, WESTON COLLEGE, WESTON, MASS.
MAGINNIS & WALSH, *Architects*
Cast stone walls, columns and balconies

Manufacture of Cast Stone

THE production of cast stone is a highly specialized business requiring skilled and experienced craftsmen and extensive manufacturing equipment. No one factor entering into the production of cast stone is most important.

The requisites for high grade cast stone are that it be durable, that it be dependably uniform in quality, and that it be permanently pleasing in appearance. As in other forms of concrete, the durability of cast stone can be measured by its physical characteristics—strength and density. These characteristics are governed by the minimum requirements set up by the American Concrete Institute. Uniformity of quality is attained only through scientific manufacturing methods and adequate plant facilities. Appearance depends largely upon selection of materials and upon the nature and extent of surface treatment.

A competent drafting department is essential because of the service which must be rendered to the architect and contractor

Molds in which cast stone is made may be of sand, wood, glue or plaster. This view shows plaster molds being prepared

Drafting

A competent drafting department is indispensable in a cast stone plant on account of the services which must be rendered to the architect and contractor. Cast stone is a product made strictly to order and the designing of the various types of units, the preparation of estimates, the making of large scale drawings, detailing and the preparation of setting plans require an accurate knowledge of cast stone technique as well as of architectural detail and style.

A well equipped wood-working shop is an important part of the modern cast stone plant

Modeling and Carving

Remarkably fine details can be faithfully reproduced in cast stone, as is shown in accompanying illustrations. Delicacy and fineness of detail in ornaments is a reflection of the care and attention devoted to that phase of production. The larger and better equipped plants have expert modellers and carvers as a part of their

Men highly skilled in their craft, and having a great deal of the artist in their makeup, are necessary to produce the artistic modeling often required

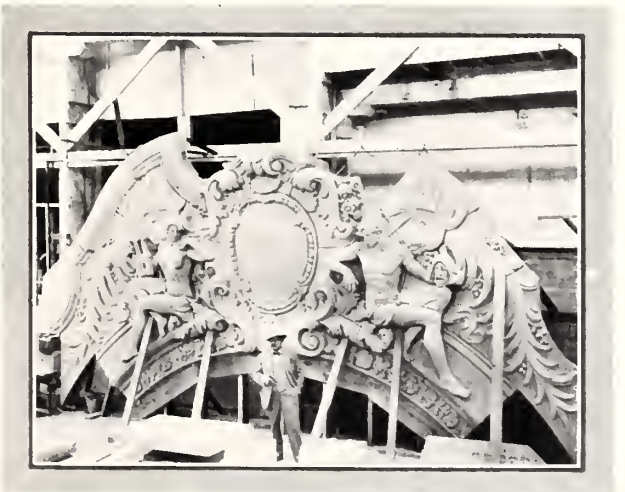
regular staff since they have found that a better interpretation of the architect's ideas can be secured by craftsmen having a knowledge of the manufacture of cast stone. It is customary for architects to approve all models either through actual inspection or through photographs before the molds are made from them.

Molding

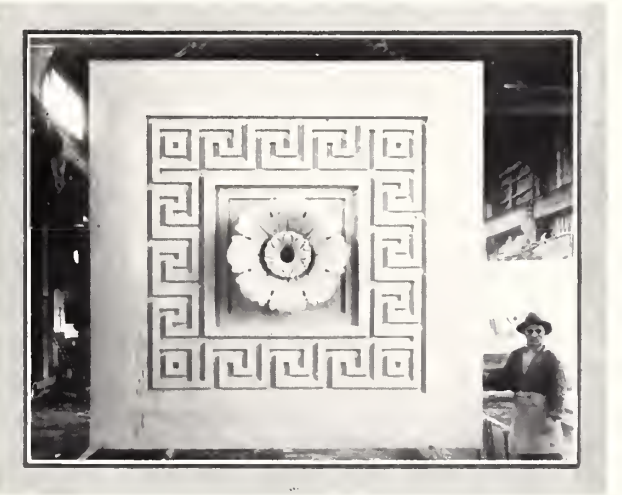
Molds in which cast stone is manufactured may be sand, wood, glue or plaster. The type of mold is closely identified with the method of manufacturing and is a phase of production which is determined by the manufacturer's experience and judgment. Regardless of the type of mold used, extreme care and accuracy in its preparation are necessary to produce cast stone having straight edges and true surfaces.

Aggregates

In so far as the aggregates affect the physical quality of cast stone, they must be hard and



Ornamental cast stone work for the Fox Theatre, San Francisco, Calif.
A picture of the front of this theatre is shown on page 16.
THOMAS W. LAMB, *Architect*, H. A. MINTON, *Associate*



Ceiling panel for West Junior High School, Erie, Pa.
This piece is 10 feet, 2 inches square and weighs 7½ tons.
MEYERS & JOHNSON, *Architects*

CLAY MODELS FOR ORNAMENTS IN A HIGH SCHOOL AT TEANECK, N. J.
HACKER & HACKER, *Architects*

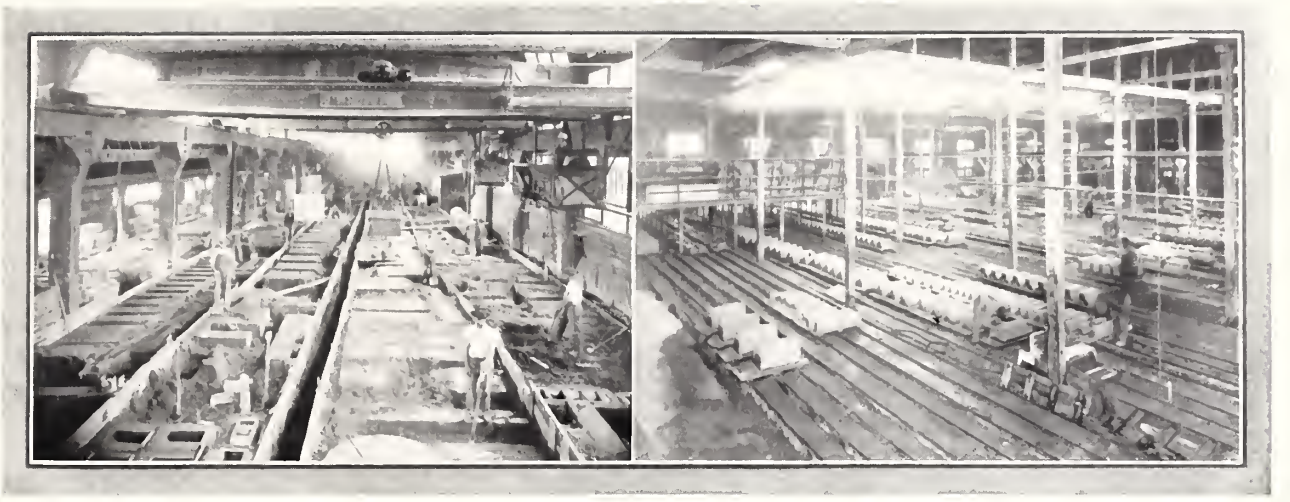
durable and properly graded. The maximum size of aggregate now commonly used in the manufacture of cast stone is three-eighths inch. Excessive amounts of aggregate material passing the No. 48 sieve detract from the quality and appearance of cast stone. In best recognized practice aggregate is separated into three or more sizes and recombined in the proportions which will produce maximum density and strength in the finished cast stone. The natural grading of aggregate as it comes from the crusher or pit is not suitable for making cast stone of durable quality and satisfactory appearance.

WINDOW BAY, D. & H. R. R. BUILDING, ALBANY, N. Y.
MARCUS T. REYNOLDS, *Architect*

Inasmuch as the appearance of cast stone is largely dependent on the aggregate, it is doubly important that the aggregate be graded properly. Reputable manufacturers recommend against those finishes which require improper grading of aggregate, especially the use of excessive amounts of fine material which would mean a sacrifice of both durability and appearance in the finished product. Too much emphasis can not be placed on the importance of the quality and grading of the aggregates used in the manufacture of cast stone.

FIRST CHURCH OF CHRIST SCIENTIST, WEST PALM BEACH, FLA.
HORACE TROMBAURER, *Architect*

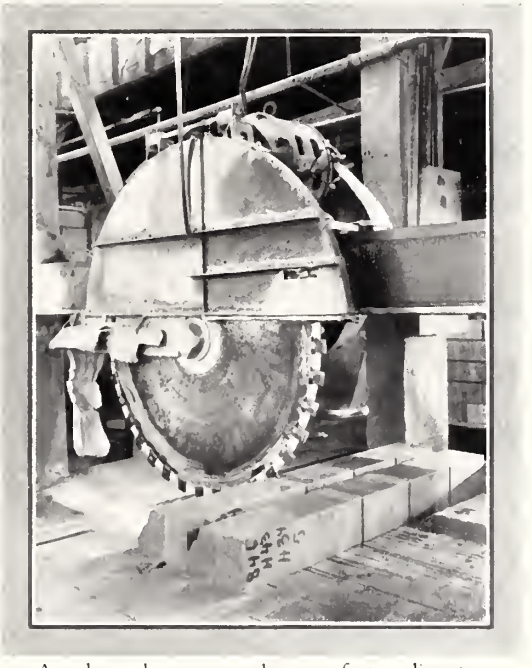
LARCHMONT NATIONAL BANK, LARCHMONT, N. Y.
FRANK A. MOORE, *Architect*



The production of cast stone is a highly specialized business requiring extensive manufacturing equipment. Views of two modern plants

Curing

The proportioning and mixing of materials and the curing of cast stone are governed by the same standard practices which apply to all other forms of concrete. Of all the factors involved in its production curing probably has the greatest effect on the physical qualities of cast stone. The haste with which present day construction is carried on makes it impracticable to set a definite period of curing for cast stone before it is placed in a building. Many of the leading manufacturers advocate a minimum age of three weeks before cast stone is used. Too much emphasis cannot be laid on the importance of thorough curing. Cast stone must have at least attained the strength required in the standard specification on page 27. Before being used it should also have been allowed to dry for a reasonable length of time following the regular damp curing period.



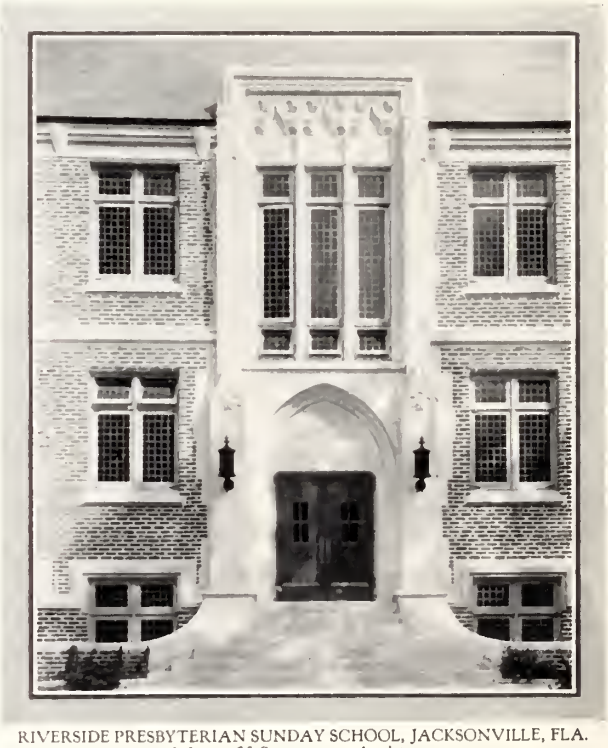
A carborundum saw nearly seven feet in diameter

Another view of a plant showing at the left a large circular saw used for cutting cast stone and in the center a carborundum planer

Loading cast stone from stock pile to cars. The cast stone is packed, usually in wood shavings, to prevent injury during transit

RECEIVING VAULT, MOUNT HOPE CEMETERY, YONKERS, N. Y.
S. L. Waller, *Architect*

ROOSEVELT HIGH SCHOOL, YONKERS, N. Y.
G. Howard Chamberlin, *Architect*



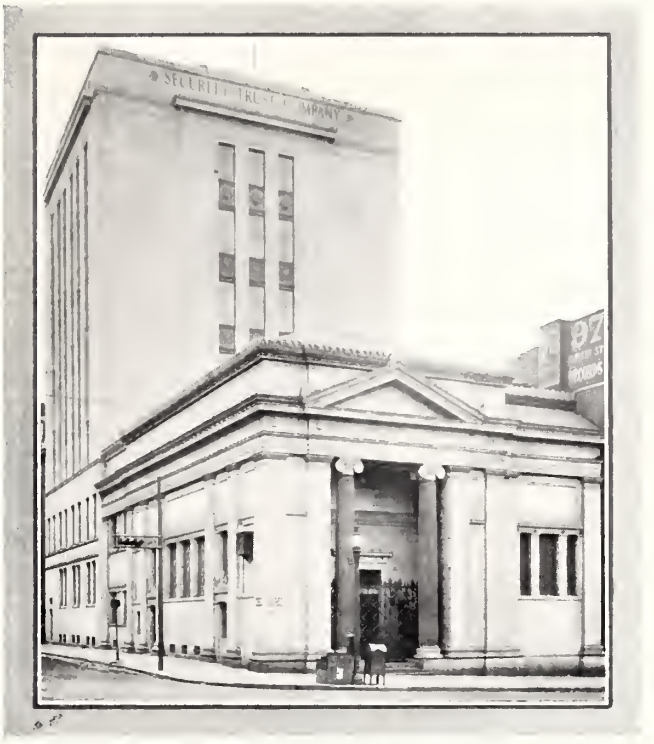
RIVERSIDE PRESBYTERIAN SUNDAY SCHOOL, JACKSONVILLE, FLA.
Mark & Sheptall, *Architects*

COLONNADE, SOLDIERS FIELD STADIUM, CHICAGO, ILL.
Holabird & Roche, *Architects*

SURFACE FINISHES

THE production of cast stone generally includes two separate groups of operations. While manufacturing operations influence physical quality, appearance of cast stone is largely dependent upon the nature and extent of the finishing operations. It is believed that the following discussion will give the reader a clear description of the different methods of finishing and the effects produced by each.

As pointed out earlier in this booklet, cast stone can easily be given any of the usual stone finishes as well as many others which are inherent in cast stone. Much of the beauty of cast stone is derived from its aggregate. However, when it comes from the mold the aggregate is generally hidden by a characteristic film of cement and other fine material which detracts from its appearance. This film can be removed by cutting or other surface treatment and the cast stone given greater character and beauty through the exposure of the aggregate.



SECURITY TRUST COMPANY, ROCHESTER, N. Y.
GORDON & KAELBER, *Architects*
The exterior cast stone finish of the seven story addition in the background accurately matches the pink Milford granite finish of the original building in the foreground built several years previously

Electric tooling machines, the wheels of which are made up of laminated carborundum discs, are used in producing machine tooled finishes

A stock of carborundum wheels dressed to various profiles for use on carborundum planers

An automatic carborundum planer dressing a flat piece of cast stone

Cast stone can be divided into three general classifications, according to the amount of equipment and labor required to produce the surface finish and the extent to which the aggregate is revealed. To assist architects in specifying cast stone the following classifications

The hand finishing department of a cut cast stone plant. Pneumatic air hammers are used to handle the various cutting tools employed

have been adopted. It should be understood that the same minimum requirements for strength and density apply to all classes of cast stone:

Cut Cast Stone
Surfaced Cast Stone
Plain Cast Stone

Cut Cast Stone

The finishing of *cut cast stone* requires special stone cutting equipment. Carborundum machinery is extensively used—carborundum saws for cutting and carborundum planers for removing the surface of cast stone and dressing profiles. Rubbing beds are used for finishing ashlar work and other flat pieces. Tooling and the recutting of all ornamental details require the services of expert stone cutters. Machine finishing produces unusually sharp arrises and true lines and fully reveals the beauty of the aggregate.

The bush hammered finish is one of the most popular finishes. It is applied with a pneumatic hammer using a single wide tooth chisel

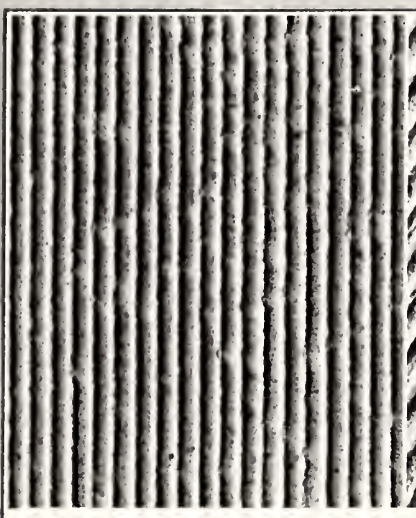
The following are types of surface finishes applied to cut cast stone:

Planer Rubbed	*Machine Tooled*
Bush Hammered	*Hand Tooled*
Crandalled	*Sawed*

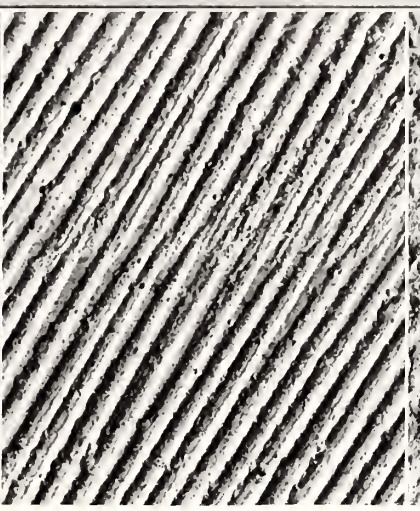
Surfaced Cast Stone

The finishing of *surfaced cast stone*, as the term indicates, involves the removal of the thin

An illustration showing the type of tool and method of applying crandalled finishes. The finish is varied by changing the teeth

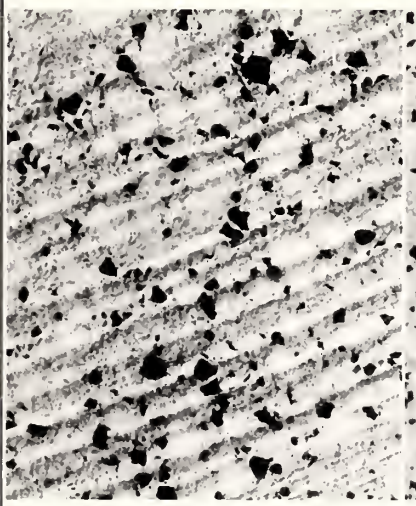


Machine Tooled Finish



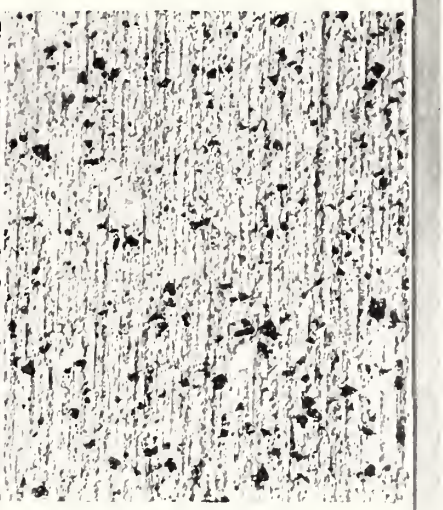
Hand Tooled Finish

Crandalled Finish

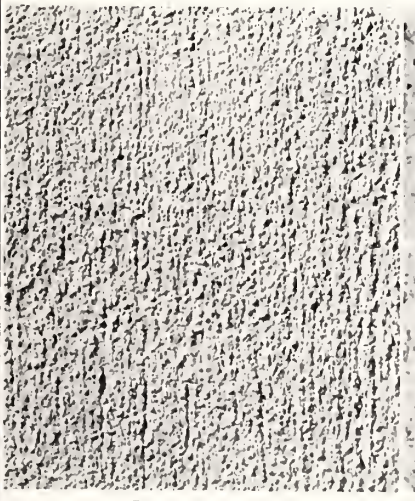


Sawed Finish

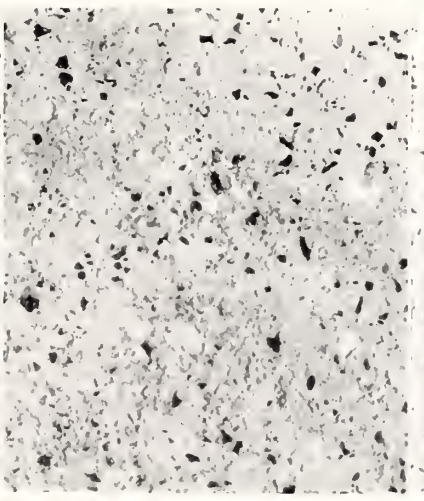
Planer Rubbed Finish



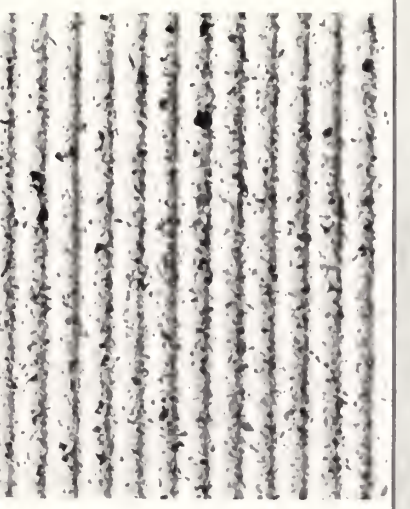
Bush Hammered Finish



Brushed Finish



Hand Rubbed Finish



Acid Washed Finish

Carborundum planer dressing the profile of a piece of cast stone

Rubbing bed used in finishing ashlar and other flat work

film of cement and other fine material from the surface of cast stone by acid washing, hand rubbing, brushing or other similar treatments. Typical finishes applied to surfaced cast stone are:

Hand Rubbed *Brushed* *Acid Washed*

Plain Cast Stone

Cast stone coming under the classification of *plain cast stone* is given no surface finish other than that imparted by the mold in the process of its manufacture.

Conclusion

THE feeling imparted to cast stone through the application of a texture or finish enhances its natural beauty. It has been explained that the purpose of the surface treatment is to reveal the aggregate and fully develop the architectural possibilities of the material. Beyond the point at which it comes from the mold, there is considerable difference in expense involved in finishing the three classes of cast stone, based entirely upon the method and extent of surface treatment. As would be expected, cast stone on which special equipment and skilled labor are used in the finishing operations is naturally more expensive to produce.

From the foregoing discussion it will be seen that the nature of its surface finish must be carefully considered whenever cast stone is being specified. Each class of cast stone has a field of use for which it is especially adapted. Which of the three classes is to be selected for a particular job depends upon the nature of the building, the style of architecture and the personal tastes of architect and owner.

In any case, the class of cast stone and surface finish should be definitely selected and clearly specified before bids are requested. It is also important to make sure that manufacturers bidding on a job are equipped to furnish cast stone strictly according to specification, both as to quality and finish. Samples of cast stone as selected should be on file in the architect's office and no variation from quality or finish should be permitted.

Manufacturers invite visits from architects and customers and are glad to explain the details of their plant operation. The inspection of a plant will supply considerable information that will be helpful in specifying cast stone and give a true appreciation of the specialized nature of the business.

Tentative Standard Specification for Cast Stone

I General

1. The term "cast stone" shall be understood to mean a building stone manufactured from portland cement concrete, precast and set in place as trim or facing on or in buildings and other structures.

2. The minimum average compressive strength of cast stone at the age of 28 days or less shall be 5,000 pounds per square inch when tested as 2 by 2 inch cylinders or 2 by 2 inch cubes in the manner hereinafter specified.

3. At the age of 28 days or less the average absorption of cast stone shall be not less than 3% and not more than 7% of water by dry weight of the specimen when tested as 2 by 2 inch cylinders or 2 by 2 inch cubes in the manner hereinafter specified.

4. All aggregate used in the manufacture of cast stone shall be of known durable quality.

II Selection of Specimens for Testing

5. Specimens for both compression and absorption tests shall be cut from stone as delivered on the job or from regular stock in the yard. Samples from which specimens will be cut shall be selected by the purchaser or his representative.

6. Specimens of faced cast stone for compression tests shall be cut in such a manner that the specimens are composed of approximately one-half of facing and one-half of backing material. Specimens shall be tested in the position which the cast stone is laid in wall.

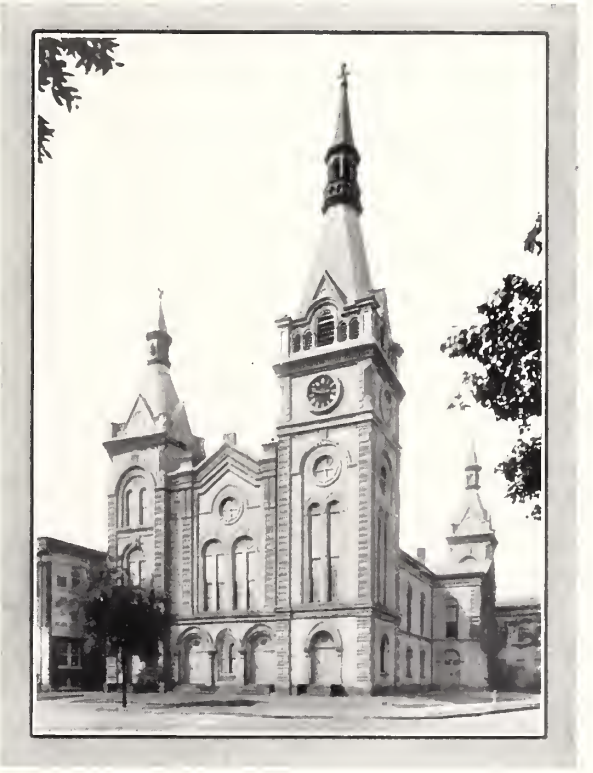
III Methods of Testing

7. Not less than three and preferably five specimens shall be required for each test. In the event of failure to meet requirements in the first test, the test may be repeated on a second set of specimens.

8. Specimens for absorption test shall be dried at a temperature between 215° F. and 225° F. until the loss in weight is not more than 0.1% in two hours of drying. They shall be weighed and then be submerged in water at a temperature of between 60° F. and 80° F. for 24 hours. The specimens shall then be removed from the water, the surface water wiped off with a damp cloth and the specimens weighed. The percentage of absorption is the difference in weight divided by the dry weight of the specimen and multiplied by 100.

9. Specimens for strength test shall be dried at a temperature of between 215° F. and 225° F. until the loss in weight is not more than 0.1% in two hours of drying.

10. If bearing surfaces of specimens for strength test are not smooth, they shall be made so by grinding. If they cannot be ground to a smooth surface they shall be capped with a mixture of ½ part portland cement and ½ part plaster of paris, which shall be allowed to harden at least 5 hours before the test. The cap shall be formed by spreading the capping material upon a plate glass and pressing the specimen firmly on it making the cap as thin as possible.



DWIGHT PLACE CHURCH, NEW HAVEN, CONN.
This old church was built of cast stone in 1871. It is in excellent condition today and is a splendid example of the durability of well made cast stone

11. Load shall be applied through a spherical bearing block placed on top of the specimen in a vertical testing machine. The dimensions of the bearing block shall be the same, or slightly larger, than those of the test specimen.

12. Load shall be applied uniformly and without shock. The speed of the moving head of the machine shall be not more than .05 of an inch per minute when the machine is running idle.

13. Specimen shall be loaded to failure and the unit compressive strength calculated in pounds per square inch. The type of failure and appearance of specimen shall be noted.

THE Cast Stone Institute is an organization of cast stone manufacturers formed for the purpose of improving the quality of cast stone and of disseminating information regarding its use. The activities of the Institute are designed to benefit both the industry and its patrons.

The Institute solicits the cooperation of architects and users of cast stone. It invites requests for information and assistance in matters involving cast stone.

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